

**FIRST RECORD OF *LASIUS ILLYRICUS* ZIMMERMANN, 1935
(HYMENOPTERA, FORMICIDAE) FROM ARMENIA**

E. Schifani^{1, 2,*}, B. Massa³

1) Department of Chemistry, Life Sciences and Environmental Sustainability (SCVSA), University of Parma, Parco Area delle Scienze 11/A, I-43124, Parma, Italy. *Corresponding author. E-mail: enrsc8@gmail.com

2) Department of Biological, Chemical and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo, Via Archirafi 18, I-90123, Palermo, Italy.

3) Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale delle Scienze Ed. 5A, I-90128, Palermo, Italy.

Summary. The ant *Lasius illyricus* Zimmermann, 1935, a West-Palearctic member of the *Lasius emarginatus*-complex, was initially described as a subspecies of *L. alienus* (Foerster, 1850). Twenty years later, it became a junior synonym of *L. alienus* and then as junior synonym of its sibling species *L. emarginatus* (Olivier, 1792). Only recently its status as *bona species* was proposed. As a consequence, the knowledge over the distribution of this taxon is still very fragmented. Here we report its occurrence in Armenia for the first time, suggesting that it may be widespread around the Black Sea and Transcaucasia.

Key words: ants, *Lasius emarginatus*, sibling species, distribution, biogeography, Black Sea, Caucasus, cryptic species.

Е. Цифани, Б. Масса. Первое указание *Lasius illyricus* Zimmermann, 1935 (Hymenoptera, Formicidae) из Армении // Дальневосточный энтомолог. 2020. N 398. С. 24-28.

Резюме. Муравей *Lasius illyricus* Zimmermann, 1935, западно-палеарктический представитель комплекса *Lasius emarginatus* был описан как подвида *L. alienus* (Foerster, 1850). Двадцать лет спустя он рассматривался как синоним *L. alienus*, а затем – как синоним близкого *L. emarginatus* (Olivier, 1792). И только недавно этот вид стал считаться самостоятельным. В результате сведения об его распространении остаются фрагментарными. Из Армении *L. illyricus* приводится впервые, что позволяет предположить широкое распространение этого вида в регионе Черного моря и Закавказье.

INTRODUCTION

The formicine ant genus *Lasius* Fabricius, 1804 currently counts 117 extant and 23 fossil taxa (AntWeb, 2019), and inhabits the entire Holarctic region (AntMaps, 2019). An ecologically very important group, it has been widely used as a model for many kinds of studies (Hölldobler & Wilson, 1990; Seifert, 2018). An updated phylogenetic framework of the genus, usually divided in many subgenera, was provided by Maruyama *et al.* (2008) and showed two major lineages. Most of the evolutive lineages of the group are characterized by

temporary social parasitism (see Buschinger, 2009) at the expense of congeneric species (Maruyama *et al.*, 2008).



Fig. 1. *Lasius illyricus* Zimmermann, 1935 from Armenia, larger worker. Scale bar: 0.5 mm.

Lasius diversity has long been significantly underestimated in the past: about 65 years ago, less than 30 species were thought to exist worldwide (Wilson, 1955). According to a recent estimate by Seifert (2018), more than 100 (including undescribed species) could be found in the Palearctic alone. Molecular data indicate that the Nearctic fauna probably hides a significant number of undescribed species as well (Schär *et al.*, 2018). In the West-Palearctic region, only 7 species were recognized in the free-living *Lasius* s. str. subgenus for a long time (Wilson, 1955). However, after many studies, the current number of valid taxa is many times higher (Van Loon *et al.*, 1990; Seifert, 1991; Seifert, 1992, Schlick-Steiner *et al.*, 2003; Borowiec & Salata, 2013; Seifert & Galkowski, 2016; Salata & Borowiec, 2018). The *Lasius emarginatus* complex, belonging to *Lasius* s. str., counts 3 West Palearctic described species according to Seifert (2018): the European *L. emarginatus* (Olivier, 1792), the Eastern-Mediterranean *L. illyricus* Zimmermann, 1935 and *L. tebessae* Seifert, 1992 from the Maghreb. Due to their apparently smaller geographic ranges and only recent recognition, many biological aspects of the latter two species are currently much less known than in *L. emarginatus*. About 30 years ago, a major revision of the *Lasius* s. str. subgenus was produced (Seifert, 1992), containing new description of most of the currently valid West-Palearctic taxa of this group. However, at that time, *Lasius illyricus* was moved from synonymy to *L. alienus* (Foerster, 1850) to synonymy to *L. emarginatus* (although some uncertainty was expressed by the author). Only recently Borowiec & Salata (2013) elevated it to species rank, describing some key morphological features and providing ecological information. Additional means for morphological distinction from *L. emarginatus* were later provided by Seifert (2018) in the form of a discriminant function. Chaetotaxy describes most of its morphological differences from *L. emarginatus*.

As a result of this confused taxonomic history and only recent recognition, *L. illyricus* distribution range, which at least partly overlaps with the similar *L. emarginatus* (Borowiec & Salata, 2013; Seifert, 2018), still requires much investigation. The species is currently known to inhabit Austria (an isolated and unexplained population near Wien), Azerbaijan, the Crimean Peninsula, Croatia (its *terra typica*), Greece, Macedonia, Montenegro and Serbia (Borowiec & Salata, 2013; Seifert, 2018; Bračko, 2019). Unpublished data also testify its presence in Turkey (Kiran & Karaman, in press). Such distribution range is mostly discontinuous due to insufficient investigation, and its boundaries are still not well-defined. Moreover, information on the ecology and biology of the species is also very scarce. Ecological segregation from *L. emarginatus* due to slightly different habitat preferences is witnessed in Greece (Borowiec & Salata, 2013), but no information is available from regions in which *L. emarginatus* is probably absent.

Here we present the first records of this species from Armenia, further reinforcing the idea that the species may be widespread in Transcaucasia.

MATERIAL AND METHODS

Specimens were stored in the Enrico Schifani private collection, Palermo, Italy (ESPI) in 99% EtOH. They were studied under microscopic stereoscopes and photographed by using a Canon MP-E 65mm f/2.8 1–5× Macro Photo lens along with a Canon 1300D reflex camera. The software Helicon Focus was used to fuse images. Measurements were taken from pictures by using the software ImageJ. Identification was performed according to the indications presented by Borowiec & Salata (2013) and by using Seifert's (2018) discriminant function to distinguish *L. illyricus* from *L. emarginatus*. Moreover, it was facilitated by direct comparison with *L. illyricus* specimens from Greece (L. Borowiec leg., ESPI) and *L. emarginatus* specimens from the Italian peninsula and Sicily (E. Schifani leg., ESPI).

NEW RECORD

Lasius illyricus Zimmermann, 1935

Figs 1, 2

MATERIAL. **Armenia:** Lori Province, Teghut, Kharatanots gorge, 910 m, 13.X 2017, 2 workers, leg. M. Kalashian.

NOTES. Two workers were recovered from an Orthoptera sample. Absolute number of erect setae on the scapi, a character highlighted by Borowiec & Salata (2013) varied between the two workers, being higher in the larger specimens (Figs 1, 2).

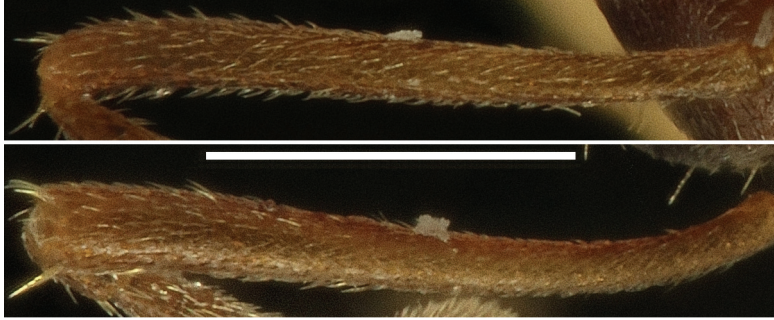


Fig. 2. *Lasius illyricus* Zimmermann, 1935 from Armenia, smaller worker. Detail of the right scapus in antleral (above) and dorsal view (below). Scale bar: 0.5 mm.

DISCUSSION

This new record extends the species range within the Eastern part of its distribution range. Comments made by Seifert (1992) and Bračko (2019) suggest that all past records of *L. emarginatus* from Transcaucasia may indeed represent *L. illyricus* instead and future investigations should establish whether its range extends further East (e.g. to the Caspian Sea, see Vigna Taglianti *et al.*, 1999). Moreover, molecular data, currently not available, could prove to be significantly helpful to shed light on the identity and biogeographic history of this taxon.

ACKNOWLEDGEMENTS

We thank very much Marcus Kalashian who sent to B.M. the Armenian ant specimens within a sample of Orthoptera, and Lech Borowiec who sent to E.S. Greek specimens of *L. illyricus*.

REFERENCES

- AntWeb. 2019. <<https://www.antweb.org/description.do?subfamily=formicinae&genus=lasius&rank=genus>> (accessed at: 13.08.2019)
AntMaps. 2019. <<https://antmaps.org/?mode=diversity&genus=Lasius>> (accessed at: 13.08.2019.)
Borowiec, L. & Salata, S. 2013. Ants of Greece – additions and corrections (Hymenoptera: Formicidae). *Genus*, 24: 335–401.

- Bračko, G. 2019. New data on the ant fauna (Hymenoptera: Formicidae) of Azerbaijan. *Caucasian Entomological Bulletin*, 15: 165–175. DOI: 10.23885/181433262019151-165175
- Buschinger, A. 2009. Social parasitism among ants: a review (Hymenoptera: Formicidae). *Myrmecological News*, 12: 219–235.
- Hölldobler, B. & Wilson, E.O. 1990. *The ants*. Harvard University Press.
- Kiran, K. & Karaman, C. Additions to the Ant Fauna of Turkey (Hymenoptera, Formicidae). *Zoosystema*, in press.
- Maruyama, M., Steiner, F.M., Stauffer, C., Akino, T., Crozier, R.H. & Schlick-Steiner, B.C. 2008. A DNA and morphology based phylogenetic framework of the ant genus *Lasius* with hypotheses for the evolution of social parasitism and fungiculture. *BMC evolutionary biology*, 8: 237. DOI: 10.1186/1471-2148-8-237
- Salata, S. & Borowiec, L. 2018. A new species of the ant genus *Lasius* Fabricius, 1804 from Crete (Hymenoptera, Formicidae). *ZooKeys*, 789: 139–159. DOI: 10.3897/zookeys.789.27022
- Schär, S., Talavera, G., Espadaler, X., Rana, J.D., Andersen, A., Cover, S.P. & Vila, R. 2018. Do Holarctic ant species exist? Trans - Beringian dispersal and homoplasy in the Formicidae. *Journal of Biogeography*, 45: 1917–1928. DOI: 10.1111/jbi.13380
- Schlick-Steiner, B.C., Steiner, F.M., Schodl, S. & Seifert, B. 2003. *Lasius austriacus* sp. n., a Central European ant related to the invasive species *Lasius neglectus*. *Sociobiology*, 41: 725–736.
- Seifert, B. 1991. *Lasius platythorax* n. sp., a widespread sibling species of *Lasius niger* (Hymenoptera: Formicidae). *Entomologia Generalis*, 16: 69–81.
- Seifert, B. 1992. A taxonomic revision of the Palaearctic members of the ant subgenus *Lasius* s. str. (Hymenoptera, Formicidae). *Abhandlungen und Berichte des naturkundemuseums Görlitz*, 66: 1–67.
- Seifert, B. & Galkowski, C. 2016. The Westpalaearctic *Lasius paralienus* complex (Hymenoptera: Formicidae) contains three species. *Zootaxa*, 4132: 44–58. DOI: 10.11646/zootaxa.4132.1.4
- Seifert, B. 2018. *The Ants of Central and North Europe*. Lutra Verlags- und Vertriebsgesellschaft, Tauer, Germany.
- Van Loon, A.J., Boomsma, J.J. & Andrasfalvy, A. 1990. A new polygynous *Lasius* species (Hymenoptera; Formicidae) from central Europe. *Insectes Sociaux*, 37: 348–362.
- Vigna Taglianti, A., Audisio, P.A., Biondi, M., Bologna, M.A., Carpaneto, G.M., De Biase, A., Fattorini, S., Piattella, E., Sindaco, R., Venchi, A. & Zapparoli, M. 1999. A proposal for a chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. *Biogeographia*, 20: 31–59. DOI: 10.21426/B6110172
- Wilson, E.O. 1955. A monographic revision of the ant genus *Lasius*. *Bulletin of the museum of Comparative Zoology*, 113: 1–201.

© **Far Eastern entomologist (Far East. entomol.)** Journal published since October 1994.

Editor-in-Chief: S.Yu. Storozhenko

Editorial Board: A.S. Lelej, S.A. Belokobylskij, M.G. Ponomarenko, E.A. Beljaev, V.A. Mutin, E.A. Makarchenko, A.V. Gorochoy, T.M. Tiunova, M.Yu. Proshchalykin, S.A. Shabalin

Address: Federal Scientific Center of the East Asia Terrestrial Biodiversity (former Institute of Biology and Soil Science), Far East Branch of the Russian Academy of Sciences, 690022, Vladivostok-22, Russia.

E-mail: storozhenko@biosoil.ru

web-site: <http://www.biosoil.ru/fee>